UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,471	11/13/2006	John Graeme Houston	9931-009US	6298

79526 7590 07/23/2010

DeMont & Breyer, LLC
100 Commons Way, Ste. 250
Holmdel, NJ 07733

EXAMINER	
TANNER, JOCELIN C	

ART UNIT	PAPER NUMBER
3731	

NOTIFICATION DATE	DELIVERY MODE
07/23/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

international@dblaw.com

Office Action Summary	Application No.	Applicant(s)	
	10/562,471	HOUSTON ET AL.	
	Examiner	Art Unit	
	JOCELIN C. TANNER	3731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 May 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5,6,29-31,33-44 and 46-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 5, 6, 29-31, 33-44 and 46-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the Amendment filed 13 May 2010. Claims 1-3, 5, 6, 29-31, 33-44 and 46-54 are currently pending. The Examiner acknowledges the new claims 53 and 54 and cancelled claims 4, 7-28, 32, and 45.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 13 May 2010 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 5, 6, 29-31, 33-44 and 46-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Houston et al. (EP 1254645A1) in view of Palmaz et al. (US Patent No. 6,190,404).

4. Regarding claims **1, 37 and 54**, Houston et al. discloses an internal formation for a conduit, the formation having a helical-flow inducing means or a “longitudinally extending member” (12) adapted to extend along an inside surface of at least a portion of the length of the conduit, the longitudinally extending member having a first surface

that is at least directed towards an inlet or the conduit and a second surface of the member is at least partially directed towards the outlet of the conduit, the first and second surfaces that are coupled together by a third surface or apex therebetween, the formation effects spiral flow of a fluid flowing through the conduit (column 1, lines 56-58, column 2, lines 10-12, 15-10, FIG 1). However, Houston et al. fails to disclose a 20º angle of the first surface subtending with a diameter of the conduit extending through a portion of the profile of the longitudinally extending member.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided a 20º angle of the first surface subtending with a diameter, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Houston et al. discloses helical grooving and/or ridging or "longitudinally extending member" which may be of any cross-sectional shape and size [0009], however, Houston et al. fails to expressly disclose the longitudinally extending member having an asymmetric profile in a direction transverse of the longitudinal axis of the member.

Palmaz et al. teaches a stent having grooves within or on the inner surface that may be asymmetrical (column 5, lines 45-50).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the ridges of Houston et al., with an

asymmetric profile, as taught by Palmaz et al., for the predictable result of inducing helical flow.

5. Regarding claim **2**, Houston et al. discloses a longitudinally extending member (12) that extends helically along the length of the conduit (column 2, lines 1-2 and 7-9, FIG. 1).

6. Regarding claim **3**, Houston et al. discloses a longitudinally extending member (12) extending helically along the internal side wall of the conduit.

7. Regarding claim **5**, Houston et al. discloses a first surface of the longitudinal member to have a planar portion and/or a curved portion (FIG. 1). Please see marked up figure below.

8. Regarding claim **6**, Houston et al. discloses a second surface having a planar portion and/or a curved portion (FIG. 1). Please see marked up figure below.

9. Regarding claim **29**, Houston et al. discloses a second surface having a curved portion, the curved portion being concave or convex, or a combination of concave and convex (FIG. 1). Please see marked up figure below.

10. Regarding claim **30**, Houston et al. discloses a first surface having a curved portion, the curved portion being concave or convex, or a combination of concave and convex (FIG. 1). Please see marked up figure below.

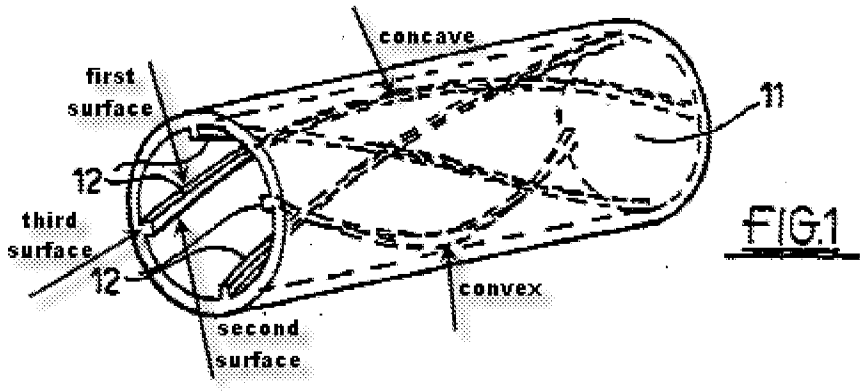

FIG.1

11. Regarding claim **31**, the combination of Houston et al. and Palmaz et al. discloses all of the limitations previously discussed except for a first surface subtending with the diameter of the conduit extending through the portion of the profile of the longitudinally extending member at a smaller angle than the second surface. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided a smaller subtending angle of the first surface, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

12. Regarding claim **33**, the combination of Houston et al. and Palmaz et al. discloses all of the limitations previous discussed except for the first surface subtending the diameter of the conduit with an angle between 5º and 15º.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected a subtending angle having a value between 5° and 15°, since it has been held that where the general conditions of a claim are

disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

13. Regarding claim **34**, the combination of Houston et al. and Palmaz et al. discloses all of the limitations previous discussed except for an angle that the first surface subtends with the diameter of the conduit being substantially 10°.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected a subtending angle having a value of 10°, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

14. Regarding claim **35**, the combination of Houston et al. and Palmaz et al. discloses all of the limitations previous discussed except for a distance along the internal surface of the conduit from the diameter to the point at which the second surface meets the internal surface of the conduit to be substantially 25% of the internal width of the conduit. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have constructed the distance along the internal surface to the point at which the second surface meets the internal surface to be 25% of the internal width, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

15. Regarding claim **36**, Houston et al. discloses first and second surfaces that extend from the internal surface of the conduit towards each other and towards a central longitudinal axis of the conduit (FIG.1). Please see marked up figure above.

16. Regarding claim **38**, Houston et al. discloses an internal formation having a third surface formed of an apex coupling the first and second surfaces or a third surface that can be a curved if the cross-sectional shape were sinusoidal [0009] (FIG.1).

17. Regarding claim **39**, Palmaz et al. discloses an internal formation having a longitudinally extending member with asymmetric profile and extends along an inside surface of a conduit (column 5, lines 45-50).

18. Regarding claim **40**, Houston et al. discloses a conduit used for implantation or in devices for improving blood circulation (column 7, lines 20-22, FIG. 1).

19. Regarding claim **41**, Houston et al. discloses a blood flow tubing that is a vascular prosthesis (column 3, lines 12-14).

20. Regarding claim **42**, Houston et al. discloses a vascular prosthesis that is a graft (column 3, line 39-41).

21. Regarding claim **43**, Houston et al. discloses a vascular prosthesis that is a stent (column 3, lines 42-46).

22. Regarding claim **44**, Houston et al. discloses a vascular prosthesis that is a graft/stent combination (column 3, line 39-41).

23. Regarding claim **46**, Houston et al. discloses a fluid as being a liquid (column 4, lines 27-29).

24. Regarding claim **47**, Houston et al. discloses a conduit having two or more internal formations (FIG. 1).

25. Regarding claim **48**, Houston et al. discloses formations that are in parallel around the conduit (Figs. 2, 4) wherein the formations extend in the same direction and do not intersect.

26. Regarding claim **49**, Houston et al. discloses formations being in series around the circumference of the conduit (FIG. 2).

27. Regarding claim **50**, Houston et al. discloses formations that differ in height and/or the angle of the first and/or second faces by selecting ridges having various shapes or sizes (column 2, lines 3-5).

28. Regarding claim **51 and 52**, Houston et al. discloses formations differing in the angle of first faces and second faces wherein the ridging may taper in the direction of flow or in the opposite direction [0012].

29. Regarding claim **53**, Palmaz et al. teaches a groove having a cross-sectional configuration that may not vary along the length (column 6, lines 14-18).

30. Claims 1-3, 5, 6, 29-31, 33-39, 46-49, 53 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (FR 2657945A) in view of Palmaz et al. (US Patent No. 6,190,404).

31. Regarding claims **1, 37 and 54**, Lee discloses an internal formation for a conduit, the formation having a helical-flow inducing means or a "longitudinally extending member" (4) adapted to extend along an inside surface of at least a portion of the length of the conduit, the longitudinally extending member having a first surface that is at least directed towards an inlet or the conduit and a second surface of the member is at least partially directed towards the outlet of the conduit, the first and second surfaces that are

coupled together by a third surface or apex therebetween, the formation effects spiral flow of a fluid flowing through the conduit (paragraph 6, Figs. 1-3). However, Lee fails to disclose a 20º angle of the first surface subtending with a diameter of the conduit extending through a portion of the profile of the longitudinally extending member.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided a 20º angle of the first surface subtending with a diameter, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Lee fails to expressly disclose the longitudinally extending member having an asymmetric profile in a direction transverse of the longitudinal axis of the member.

Palmaz et al. teaches a stent having grooves within or on the inner surface that may be asymmetrical (column 5, lines 45-50).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the ridges of Lee, with an asymmetric profile, as taught by Palmaz et al., for the predictable result of inducing helical flow.

32. Regarding claim **2**, Lee discloses a longitudinally extending member (4) that extends helically along the length of the conduit (FIG. 1).

33. Regarding claim **3**, Lee discloses a longitudinally extending member (12) extending helically along the internal side wall of the conduit.

34. Regarding claim **5**, Lee discloses a first surface of the longitudinal member to have a planar portion and/or a curved portion (FIG. 1).

35. Regarding claim **6**, Lee discloses a second surface having a planar portion and/or a curved portion (FIG. 1).

36. Regarding claim **29**, Lee discloses a second surface having a curved portion, the curved portion being concave or convex, or a combination of concave and convex (FIG. 1).

37. Regarding claim **30**, Lee discloses a first surface having a curved portion, the curved portion being concave or convex, or a combination of concave and convex (FIG. 1).

38. Regarding claim **31**, the combination of Lee and Palmaz et al. discloses all of the limitations previously discussed except for a first surface subtending with the diameter of the conduit extending through the portion of the profile of the longitudinally extending member at a smaller angle than the second surface. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided a smaller subtending angle of the first surface, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

39. Regarding claim **33**, the combination of Lee and Palmaz et al. discloses all of the limitations previous discussed except for the first surface subtending the diameter of the conduit with an angle between 5º and 15º.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected a subtending angle having a value between 5°

and 15°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

40. Regarding claim **34**, the combination of Lee and Palmaz et al. discloses all of the limitations previous discussed except for an angle that the first surface subtends with the diameter of the conduit being substantially 10°.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected a subtending angle having a value of 10°, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

41. Regarding claim **35**, the combination of Lee and Palmaz et al. discloses all of the limitations previous discussed except for a distance along the internal surface of the conduit from the diameter to the point at which the second surface meets the internal surface of the conduit to be substantially 25% of the internal width of the conduit. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have constructed the distance along the internal surface to the point at which the second surface meets the internal surface to be 25% of the internal width, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

42. Regarding claim **36**, Lee discloses first and second surfaces that extend from the internal surface of the conduit towards each other and towards a central longitudinal axis of the conduit (FIG.1).

43. Regarding claim **38**, Lee discloses an internal formation having a third surface formed of an apex coupling the first and second surfaces (FIG.1).

44. Regarding claim **39**, Palmaz et al. discloses an internal formation having a longitudinally extending member with asymmetric profile and extends along an inside surface of a conduit (column 5, lines 45-50).

45. Regarding claim **46**, Lee discloses a fluid as being a liquid (paragraph 7).

46. Regarding claim **47**, Lee discloses a conduit having two or more internal formations (FIG. 1).

47. Regarding claim **48**, Lee discloses formations that are in parallel around the conduit (Figs. 1) wherein the formations extend in the same direction and do not intersect.

48. Regarding claim **49**, Lee discloses formations being in series around the circumference of the conduit (FIG. 1).

49. Regarding claim **53**, Palmaz et al. teaches a groove having a cross-sectional configuration that may not vary along the length (column 6, lines 14-18).

Response to Arguments

50. Applicant's arguments filed 13 May 2010 have been fully considered but they are not persuasive. The Applicant contends that the unexpected benefit of a spiral flow of a

fluid through a conduit confers surprising advantageous properties such as uniform and smooth flow that would not have been obvious at the priority date of the instant applicaiton. However, Houston et al. discloses that the helical-flow inducing means are capable of inducing helical flow such that turbulence is reduced [0008]. The Applicant contends that Palmaz et al. fails to indicate which profile shape is optimal. However, since Palmaz et al. teaches several profile shapes, it would have been obvious that a skilled person would have pursued the known options within their technical grasp with the reasonable expectation that at least one would be successful. The Applicant contends that the use of a profile shape of Palmaz et al. would have been selected as one best to increase migration of cells along the surface of the stent. However, Houston discloses ridging and/or grooving that may be of any cross-sectional shape and size [0009]. Palmaz teaches various shapes and sizes including symmetrical or asymmetrical patterns that may be applied to grooves in or on the inner surface of the stent (column 5, lines 45-48, column 6, lines 27-31). The various shapes and sizes would be obvious to apply to ridges as well. Therefore, the Palmaz reference is used to suggest that asymmetrical and symmetrical patterns may be included in Houston's suggestion of any cross-sectional shape and size of ridging and/or grooving. The Applicant contends that Palmaz et al. fails to teach asymmetric grooves that remain the same along its entire length. However, Palmaz et al. teaches a groove having a cross-sectional configuration that may not vary along the length (column 6, lines 14-18).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOCELIN C. TANNER whose telephone number is (571)270-5202. The examiner can normally be reached on Monday through Thursday between 9am and 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anhtuan Nguyen can be reached on 571-272-4963. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jocelin C. Tanner/
7/16/2010
Examiner, Art Unit 3731

/Anhtuan T. Nguyen/
Supervisory Patent Examiner, Art Unit 3731
7/17/10